



## DEPARTMENT OF ENERGY

### 10 CFR Part 431

[EERE-2017-BT-TP-0053]

RIN 1904-AE17

#### Energy Conservation Program: Test Procedure for Metal Halide Lamp Fixtures

**AGENCY:** Office of Energy Efficiency and Renewable Energy, Department of Energy.

**ACTION:** Notice of proposed rulemaking and request for comment.

**SUMMARY:** The U.S. Department of Energy (“DOE”) proposes to amend its test procedures for metal halide lamp fixtures (“MHLFs”) to incorporate by reference the latest versions of relevant industry standards; clarify the selection of reference lamps used for testing; reorganize the content of the test procedure for better readability and clarity; and revise the standby mode test procedure for MHLFs. DOE is seeking comment from interested parties on the proposal.

**DATES:** DOE will accept comments, data, and information regarding this notice of proposed rulemaking (“NOPR”) no later than **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. DOE will hold a webinar on Thursday, August 5, 2021, from 10:00 a.m. to 2:00 p.m. See section V, “Public Participation,” for details.

**ADDRESSES:** Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at <https://www.regulations.gov>. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE-2017-BT-TP-0053, by any of the following methods:

1. *Federal eRulemaking Portal*: <https://www.regulations.gov>. Follow the instructions for submitting comments.
2. *E-mail*: to [MHLF2017TP0053@ee.doe.gov](mailto:MHLF2017TP0053@ee.doe.gov). Include docket number EERE–2017–BT–TP–0053 in the subject line of the message.

No telefacsimiles (“faxes”) will be accepted. For detailed instructions on submitting comments and additional information on this process, see section V of this document.

*Although DOE has routinely accepted public comment submissions through a variety of mechanisms, including postal mail and hand delivery/courier, the Department has found it necessary to make temporary modifications to the comment submission process in light of the ongoing Covid-19 pandemic. DOE is currently suspending receipt of public comments via postal mail and hand delivery/courier. If a commenter finds that this change poses an undue hardship, please contact Appliance Standards Program staff at (202) 586-1445 to discuss the need for alternative arrangements. Once the Covid-19 pandemic health emergency is resolved, DOE anticipates resuming all of its regular options for public comment submission, including postal mail and hand delivery/courier.*

*Docket*: The docket, which includes *Federal Register* notices, comments, and other supporting documents/materials, is available for review at <https://www.regulations.gov>. All documents in the docket are listed in the <https://www.regulations.gov> index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at <https://www.regulations.gov/docket?D=EERE-2017-BT-TP-0053>. The docket web page will contain simple instructions on how to access all documents, including public comments, in the docket. See section V for information on how to submit comments through <https://www.regulations.gov>.

**FOR FURTHER INFORMATION CONTACT:**

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For further information on how to submit a comment or review other public comments and the docket, contact the Appliance and Equipment Standards Program staff at (202) 287-1445 or by email: *ApplianceStandardsQuestions@ee.doe.gov*.

**SUPPLEMENTARY INFORMATION:**

DOE proposes to incorporate by reference the following industry standards into 10 CFR part 431:

American National Standards Institute (“ANSI”) C78.43 (ANSI C78.43-2017), “American National Standard for Electric Lamps—Single-Ended Metal Halide Lamps,” approved December 21, 2017.

ANSI C78.44 (ANSI C78.44-2016), “American National Standard for Electric Lamps—Double-Ended Metal Halide Lamps,” approved July 1, 2016.

ANSI C82.6-2015 (R2020) (ANSI C82.6-2015 (R2020)), “American National Standard for Lamp Ballasts—Ballasts for High-Intensity Discharge Lamps—Methods of Measurement,” approved March 30, 2020.

ANSI C82.9 (ANSI C82.9-2016), “American National Standard for Electric Lamps— High Intensity Discharge and Low-Pressure Sodium Lamps—Definitions,” approved July 12, 2016.

International Electrotechnical Commission (“IEC”) 62301 (IEC 62301), “Household electrical appliances – Measurement of standby power” (Edition 2.0, 2011-01).

Copies of ANSI C78.43-2017, ANSI C78.44-2016, ANSI C82.6-2015 (R2020), and ANSI C82.9-2016 are available at *www.ansi.org* or *www.nema.org*. Copies of IEC 62301:2011 are available on IEC’s website at *https://webstore.iec.ch/home*.

For a discussion of these standards, see section IV.M.

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## **I. Authority and Background**

MHLFs are included in the list of “covered products” for which DOE is authorized to establish and amend energy conservation standards and test procedures. (42 U.S.C. 6295(a)(19)) DOE’s energy conservation standards and test procedures for MHLFs are currently prescribed at subpart S of the Code of Federal Regulations (“CFR”), part 431, §§431.326 and 431.324. The following sections discuss DOE’s authority to establish test procedures for MHLFs and relevant background information regarding DOE’s consideration of test procedures for this equipment.

### A. Authority

The Energy Policy and Conservation Act, as amended (“EPCA”),<sup>1</sup> authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6311-6317) Title III, Part B<sup>2</sup> of EPCA established the Energy Conservation Program for Consumer Products Other Than Automobiles, which sets forth a variety of provisions designed to improve energy efficiency. These products include metal halide lamp fixtures, the subject of this document.<sup>3</sup> (42 U.S.C. 6292(a)(19)) MHLFs contain metal halide lamp ballasts. Because the MHLF energy conservation standards in EPCA established a minimum efficiency for the ballasts incorporated into those fixtures, this test procedure requires measurement of metal halide lamp ballast efficiency. (42 U.S.C. 6295(hh)(1)(A))

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of the EPCA specifically include definitions (42 U.S.C. 6291), energy conservation standards (42 U.S.C. 6295), test procedures (42 U.S.C. 6293), labeling provisions (42 U.S.C. 6294), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

The Federal testing requirements consist of test procedures that manufacturers of covered products must use as the basis for: (1) certifying to DOE that their products comply with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6295(s)), and (2)

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<sup>1</sup> All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Public Law 116-260 (Dec. 27, 2020).

<sup>2</sup> For editorial reasons, upon codification in the U.S. Code, Part B was re-designated Part A.

<sup>3</sup> Because of its placement in Part A of Title III of EPCA, the rulemaking for MHLFs is bound by the requirements of 42 U.S.C. 6292. However, because MHLFs are generally considered commercial equipment, as a matter of administrative convenience and to minimize confusion among interested parties, DOE adopted MHLF provisions into subpart S of 10 CFR part 431. 74 FR 12058, 12062 (Mar. 23, 2009). Therefore, DOE will refer to MHLFs as “equipment” throughout the NOPR because of their placement in 10 CFR part 431. When the NOPR refers to specific provisions in Part A of EPCA, the term “product” is used. The location of provisions within the CFR does not affect either their substance or applicable procedure.

making representations about the efficiency of those products (42 U.S.C. 6293(c)). Similarly, DOE must use these test procedures for testing to determine whether the products comply with any relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

Federal energy efficiency requirements for covered products established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6297) DOE may, however, grant waivers of Federal preemption for particular State laws or regulations, in accordance with the procedures and other provisions of EPCA. (42 U.S.C. 6297(d))

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section shall be reasonably designed to produce test results which measure energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use and shall not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

In addition, EPCA requires that DOE amend its test procedures for all covered products to integrate measures of standby mode and off mode energy consumption.

(42 U.S.C. 6295(gg)(2)(A)) Standby mode and off mode energy consumption must be incorporated into the overall energy efficiency, energy consumption, or other energy descriptor for each covered product unless the current test procedures already account for and incorporate standby and off mode energy consumption or such integration is technically infeasible. If an integrated test procedure is technically infeasible, DOE must prescribe a separate standby mode and off mode energy use test procedure for the covered product, if technically feasible. (42 U.S.C. 6295(gg)(2)(A)(ii)) Any such amendment must consider the most current versions of the

International Electrotechnical Commission (“IEC”) Standard 62301<sup>4</sup> and IEC Standard 62087,<sup>5</sup> as applicable. (42 U.S.C. 6295(gg)(2)(A))

EPCA also requires that, at least once every 7 years, DOE evaluate test procedures for each type of covered products, including MHLFs, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle. (42 U.S.C. 6293(b)(1)(A) and (b)(3))

If the Secretary determines, on her own behalf or in response to a petition by any interested person, that a test procedure should be prescribed or amended, the Secretary shall promptly publish in the *Federal Register* proposed test procedures and afford interested persons an opportunity to present oral and written data, views, and arguments with respect to such procedures. The comment period on a proposed rule to amend a test procedure shall be at least 60 days and may not exceed 270 days.<sup>6</sup> In prescribing or amending a test procedure, the Secretary shall take into account such information as the Secretary determines relevant to such procedure, including technological developments relating to energy use or energy efficiency of the type (or class) of covered products involved. (42 U.S.C. 6293(b)(2)) If DOE determines that

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<sup>4</sup> IEC 62301, Household electrical appliances—Measurement of standby power (Edition 2.0, 2011-01). Published January 27, 2011.

<sup>5</sup> IEC 62087, Methods of measurement for the power consumption of audio, video, and related equipment (Edition 3.0). Published April 13, 2011.

<sup>6</sup> DOE has historically provided a 75-day comment period for test procedure NOPRs, consistent with the comment period requirement for technical regulations in the North American Free Trade Agreement, U.S.-Canada-Mexico (“NAFTA”), Dec. 17, 1992, 32 I.L.M. 289 (1993); the North American Free Trade Agreement Implementation Act, Pub. L. 103-182, 107 Stat. 2057 (1993) (codified as amended at 10 U.S.C.A. 2576) (1993) (“NAFTA Implementation Act”); and Executive Order 12889, “Implementation of the North American Free Trade Agreement,” 58 FR 69681 (Dec. 30, 1993). However, Congress repealed the NAFTA Implementation Act and has replaced NAFTA with the Agreement between the United States of America, the United Mexican States, and the United Canadian States (“USMCA”), Nov. 30, 2018, 134 Stat. 11, thereby rendering E.O. 12889 inoperable. Consequently, since the USMCA is consistent with EPCA’s public comment period requirements and normally requires only a minimum comment period of 60 days for technical regulations, DOE now provides a 60-day public comment period for test procedure NOPRs.



test procedure revisions are not appropriate, DOE must publish its determination not to amend the test procedures. DOE is publishing this notice of proposed rulemaking (“NOPR”) in satisfaction of the 7-year review requirement specified in EPCA for both the active mode and standby mode test procedures for MHLFs. (42 U.S.C. 6293(b)(1)(A)) At this time, DOE has tentatively determined that a MHLF does not have an “off mode,” as defined by EPCA (see section I.B for further details).<sup>7</sup>

## B. Background

DOE’s existing test procedures for MHLFs for active mode and standby mode operation appear at Title 10 of the Code of Federal Regulations (“CFR”) part 431, subpart S, §431.324 (“Uniform test method for the measurement of energy efficiency and standby mode energy consumption of metal halide lamp ballasts”).

The Energy Independence and Security Act of 2007 (Public Law 110-140; EISA 2007) amended EPCA, requiring DOE to establish test procedures for metal halide lamp ballasts based on the industry standard American National Standards Institute (“ANSI”) C82.6–2005. (42 U.S.C. 6293(b)(18)) On March 9, 2010, DOE published a final rule establishing active mode and standby mode test procedures for MHLFs based on measuring ballast efficiency in accordance with ANSI C82.6-2005<sup>8</sup> (“2010 MHLF TP final rule”). 75 FR 10950. In the 2010 MHLF TP final rule, DOE determined that per EPCA’s definition of “off mode,” MHLFs do not operate in off mode because there is no condition in which the components of an MHLF are connected to the main power source and are not already in a mode accounted for in either active or standby mode. 75 FR 10954–10955.

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<sup>7</sup> EPCA defines ‘off mode’ as “the condition in which an energy-using product—(I) is connected to a main power source; and (II) is not providing any standby or active mode function. (42 U.S.C. 6295(gg)(1)(A)(ii))

<sup>8</sup> American National Standards Institute. American National Standard for lamp ballasts — Ballasts for High-Intensity Discharge Lamps – Methods of Measurement. Approved February 14, 2005.

EISA 2007 also prescribed mandatory minimum efficiency levels for certain MHLFs manufactured on or after January 1, 2009. (42 U.S.C. 6295(hh)(1)) DOE published a final rule amending energy conservation standards for MHLFs on February 10, 2014 (“2014 MHLF ECS final rule”). 79 FR 7746. These amended standards apply to all equipment manufactured in, or imported into, the United States on or after February 10, 2017. In the 2014 MHLF ECS final rule, DOE also amended the then-existing test procedure to specify the input voltage at which a ballast is to be tested and to require measuring and calculating ballast efficiency to three significant figures. 79 FR 7758.

For this rulemaking, DOE has reviewed the current active mode and standby mode test procedures for MHLFs to determine whether any amendments are necessary.

On May 30, 2018, DOE published in the *Federal Register* a request for information seeking comments on the current test procedure for MHLFs (“May 2018 RFI”). 83 FR 24680. In the May 2018 RFI, DOE requested comments, information and data regarding several issues, including (1) the availability of reference lamps; (2) updates to the incorporated ANSI standards and the potential incorporation by reference of recent Illuminating Engineering Society (“IES”), IEC, and ANSI standards; (3) the potential impact of referencing the updated standard ANSI C78.43-2013<sup>9</sup> in the definition of “ballast efficiency” and the need for clarifying the term “nominal system” in the definition of “ballast efficiency”; (4) the prevalence of metal halide lamp ballasts capable of operating more than one lamp wattage, and how this equipment should be tested; (5) the appropriate light output for testing metal halide dimming ballasts; (6) the availability and power consumption of metal halide ballasts capable of operating in standby

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<sup>9</sup> American National Standards Institute. American National Standard for electric lamps—Single-Ended Metal Halide Lamps. Approved April 8, 2013.

mode; and (7) whether high frequency electronic metal halide ballasts can be tested with the same equipment as high frequency electronic fluorescent lamp ballasts. *Id.* DOE received comments in response to the May 2018 RFI from the National Electrical Manufacturers Association (“NEMA”). This document addresses information and comments received in response to the May 2018 RFI, and proposes amendments to the test procedures for MHLFs.

## II. Synopsis of the Notice of Proposed Rulemaking

In this NOPR, DOE proposes to revise its test procedures for MHLFs to: (1) update references to industry standards; (2) clarify the selection of reference lamps to be tested with metal halide lamp ballasts; (3) reorganize the content of the test procedure for better readability and clarity; and (4) reference IEC 62301:2011 and clarify instructions for measuring standby mode energy consumption of metal halide lamp ballasts. DOE has tentatively determined that the proposed amendments described in section III of this NOPR would not alter the measured efficiency of MHLFs, or require retesting or recertification solely as a result of DOE's adoption of the proposed amendments to the test procedures, if made final. Additionally, DOE has tentatively determined that the proposed amendments, if made final, would not increase the cost of testing. DOE’s proposed actions are summarized in Table II.I and addressed in detail in section III of this proposed rulemaking.

**Table II.I Summary of Changes in Proposed TP Relative to Current TP**

<b>Current DOE TP</b>	<b>Proposed TP</b>	<b>Attribution</b>
References ANSI C78.43-2004, which describes characteristics of single-ended metal halide lamps.	References the updated version ANSI C78.43-2017 which incorporates new data sheets for additional lamps and updates ballast design information in certain data sheets.	Industry TP Update to ANSI C78.43-2017, adoption of updated version recommended by NEMA.
Does not reference an industry standard for double-ended metal halide lamps.	References ANSI C78.44-2016 to specify physical and electrical characteristics for double-ended metal halide lamps, consistent with the procedure for single-ended metal halide lamps.	Specifies how to test double-ended metal halide lamps.
To define “ballast efficiency,” references the term “nominal system” in ANSI C78.43-2004,	Revises the definition of “ballast efficiency” to remove the term “nominal system” and moves testing instructions from the definition to the test procedure.	Removes inaccurate reference to “nominal system” in “ballast efficiency” definition.

<b>Current DOE TP</b>	<b>Proposed TP</b>	<b>Attribution</b>
but that term does not appear in the ANSI standard.		
Does not define “reference lamp.”	States that metal halide lamps used for testing must meet the definition of a reference lamp found in ANSI C82.9-2016.	Defines “reference lamp” by reference to the industry standard definition of the term.
Does not provide direction for the light output level at which to test dimming ballasts in active mode.	Directs dimming ballasts to be tested in active mode while operating at the maximum input power.	Provides necessary direction for testing dimming ballasts in active mode.
Does not provide direction for which lamp to use for testing ballasts that can operate lamps of more than one wattage, or that can operate both quartz and ceramic metal halide lamps.	Directs that ballasts designated with ANSI codes corresponding to more than one lamp must be tested with the lamp having the highest nominal lamp wattage as specified in ANSI C78.43-2017 or ANSI C78.44-2016, as applicable, and that ballasts designated with ANSI codes corresponding to both ceramic metal halide lamps (code beginning with “C”) and quartz metal halide lamps (code beginning with “M”) of the same nominal lamp wattage must be tested with the quartz metal halide lamp. Adds definitions for “quartz metal halide lamp” and “ceramic metal halide lamp.”	Accommodates new products on the market.
Incorporates by reference ANSI C82.6-2005 for the measurement of standby mode power.	Incorporates by reference IEC 62301:2011 for the measurement of standby mode power.	EPCA requirement

### III. Discussion

#### A. Overall

In response to the May 2018 RFI, NEMA commented that DOE should not update the MHLF test procedure. NEMA argued that further investment in MHLF technology is not warranted, as the market for these products is declining rapidly. NEMA provided multiple data sources illustrating the low installed stock of high intensity discharge (“HID”) light sources (which include metal halide lamps) and the continued reduction in metal halide usage expected due to increased LED penetration. (NEMA, No. 2 at pp. 2-3)<sup>10</sup> NEMA also provided metal halide ballast shipment indices which showed that metal halide ballast shipments have been declining since 2014. (NEMA, No. 3 at p. 1) NEMA added that the replacement of traditional

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<sup>10</sup> A notation in this form provides a reference for information that is in the docket of DOE’s rulemaking to review test procedures for metal halide lamp fixtures (Docket No. EERE–2017–BT–TP–0053). This notation indicates that the statement preceding the reference is included in document number 2 in the docket for the MHLF test procedure rulemaking, at pages 2 through 3.

luminaires, including metal halide, with LED luminaires has already led to substantial energy savings and a drop in overall energy consumption, and that this market shift will continue to decrease energy consumption without government regulation. NEMA concluded that DOE should not update the MHLF test procedure or related energy conservation standards due to diminishing returns on potential energy savings; the expected burden of implementing new standards and test procedures; and the resulting costs which would be passed on to the consumer. (NEMA, No. 2 at pp. 4-5)

DOE is required by EPCA to evaluate test procedures for each type of covered product at least once every 7 years to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedure to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle or period of use. (42 U.S.C. 6293(b)(1)(A)) DOE is conducting this rulemaking to satisfy this 7-year EPCA review requirement. In this NOPR, DOE is only addressing the MHLF test procedure and not the applicable energy conservation standards. As such, DOE did not specifically consider energy savings or shipments of MHLFs when evaluating whether the test procedure should be amended. However, the following sections describe the changes to the test procedure that DOE proposes to make in this NOPR and the reasons DOE proposes those changes. Section III.H.1 describes the industry costs associated with the proposed changes, and section IV.B describes the impact on small businesses.

Although DOE is proposing revisions only to certain parts of the existing test procedure, DOE invites comment on all aspects of DOE's test procedure for MHLFs, including those provisions appearing at 10 CFR 429.54 and 10 CFR part 431, subpart S, as well as comments on current best practices and technological developments that may warrant additional amendments.

## B. Scope

EPCA and DOE regulations define MHLF as a light fixture for general lighting applications designed to be operated with a metal halide lamp and a ballast for a metal halide lamp. (42 U.S.C. 6291(a)(64) and 10 CFR 431.322). Metal halide ballast is defined as a ballast used to start and operate metal halide lamps. (42 U.S.C. 6291(a)(62) and 10 CFR 431.322). DOE defines metal halide lamp as an HID lamp in which the major portion of the light is produced by radiation of metal halides and their products of dissociation, possibly in combination with metallic vapors. (42 U.S.C. 6291(a)(63) and 10 CFR 431.322).

## C. References to Industry Standards

The MHLF test procedure currently incorporates by reference the 2005 version of ANSI C82.6 (“ANSI C82.6-2005”) and the 2004 version of ANSI C78.43 (“ANSI C78.43-2004”)<sup>11</sup>. Industry periodically updates its test procedure standards to account for changes in technology and/or developments in test methodology and equipment. In reviewing the current test procedure, DOE noted that updated versions of the referenced industry standards are available. DOE compared these updated versions to those versions currently referenced by DOE’s test procedure to determine to what extent, if any, incorporating by reference the latest industry standards would alter the measured energy efficiency or measured energy use, as determined under the existing test procedure, as required by EPCA. (42 U.S.C. 6293(e)(1)) Specifically, DOE reviewed the 2020 version of ANSI C82.6 (“ANSI C82.6-2015 (R2020)”) <sup>12</sup> and the 2017 version of ANSI C78.43 (“ANSI C78.43-2017”) <sup>13</sup> for this purpose. In its review of the updated

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<sup>11</sup> American National Standards Institute. American National Standard for electric lamps— Single-Ended Metal Halide Lamps. Approved May 5, 2004.

<sup>12</sup> American National Standards Institute. American National Standard for Lamp Ballasts — Ballasts for High-Intensity Discharge Lamps – Methods of Measurement. Approved March 30, 2020.

<sup>13</sup> American National Standards Institute. American National Standard for electric lamps— Single-Ended Metal Halide Lamps. Approved December 21, 2017.

versions of industry standards, DOE tentatively determined that the changes would not result in a change in measured values or test burden. (See sections III.C.1 and III.C.2 for further details.)

In addition to updating existing references to industry standards in DOE's test procedure with the most recent versions, DOE proposes to incorporate by reference additional standards related to the testing of MHLFs that are not already referenced in the current test procedure. Specifically, DOE proposes to incorporate by reference ANSI C78.44-2016<sup>14</sup> to provide lamp characteristics for double-ended metal halide lamps, ANSI C82.9-2016<sup>15</sup> to reference certain definitions, and IEC 62301:2011 for measurement of standby power. (See sections III.C.3 and III.C.4 for further details.) The following sections discuss in detail the new industry standards proposed for incorporation in this NOPR.

## 1. ANSI C82.6

ANSI C82.6-2005 is an industry standard that describes the procedures to be followed, and the precautions to be taken, in measuring the performance of ballasts that operate HID lamps. In a public meeting held on December 19, 2008, during the NOPR stage of the rulemaking process culminating in the 2010 MHLF TP final rule, NEMA informed DOE that ANSI C82.6-2005 was in the process of being revised. 75 FR 10952. Because the revised ANSI C82.6 standard was not complete at the time of the 2010 MHLF TP final rule, DOE was unable to incorporate it by reference in its test procedure for metal halide lamp fixtures. *Id.* However, DOE incorporated several of the proposed revisions to ANSI C82.6-2005 directly in the DOE test procedure based on information provided by NEMA in written comments.

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<sup>14</sup> American National Standards Institute. American National Standard for Electric Lamps— Double-Ended Metal Halide Lamps. Approved July 1, 2016.

<sup>15</sup> American National Standards Institute. American National Standard for Lamp Ballasts— High-Intensity-Discharge and Low-Pressure Sodium Lamps-Definitions. Approved July 12, 2016.

DOE's current test procedure directly references ANSI C82.6-2005 for the specifications of instruments to be used for testing, test conditions and setup, and measurements. Specifically, DOE's current test procedure references section 4 ("General Conditions for Electrical Performance Tests") and section 6 ("Ballast Measurements [Multiple-Supply Type Ballasts]") of ANSI C82.6-2005. DOE has identified several updates made to sections 4 and 6 in the 2020 version of ANSI C82.6, all of which DOE has tentatively determined are minor changes that would help further clarify and/or reaffirm the DOE test procedure and would not affect measured values under the DOE test procedure. The following paragraphs include a detailed discussion of each update.

First, the 2020 version of ANSI C82.6 added a requirement that the ballast under test must be operated until it reaches equilibrium, thereby ensuring stable conditions for testing. DOE notes that this requirement is already included in DOE's test procedure based on feedback received from NEMA in the previous rulemaking in anticipation of changes to ANSI C82.6-2005. (NEMA, No. 24<sup>16</sup> at p. 3) Hence, DOE has tentatively determined that, if incorporated by reference, this revision would not impact measured values.

Second, the 2020 version of ANSI C82.6 provided greater flexibility by recommending the use of either a "make-before-break" or fast-acting switch for the basic stabilization method when switching a reference lamp from a reference ballast circuit to a test ballast circuit. Previously, a "make-before-break" switch was specified only for high pressure sodium lamps. DOE notes that this recommendation is already included in DOE's test procedure based on feedback received from NEMA in the previous rulemaking in anticipation of changes to ANSI

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<sup>16</sup> This document was submitted to the docket of DOE's rulemaking to review energy conservation standards for fluorescent lamp ballasts (Docket No. EERE-2008-BT-TP-0017).



C82.6-2005. (NEMA, No. 24<sup>17</sup> at p. 3) Hence, DOE has tentatively determined that this revision would not impact measured values.

Third, the 2020 version of ANSI C82.6 modified the heading of section 4.4.3 from “Alternative Stabilization Method” to “Alternative Stabilization Method (Electronic Ballasts),” indicating that the alternative stabilization method is for use with electronic ballasts. Because DOE’s current test procedure already specifies that the alternative stabilization method should be used for low-frequency electronic ballasts, DOE interprets the revised section heading as simply a clarification. In addition, ANSI C82.6-2015 (R2020) added an annex with low-frequency electronic reference ballast characteristics (“Annex A Low-Frequency Electronic Reference Ballast”) for the testing of low-frequency electronic ballasts. DOE has tentatively determined that, if incorporated, this addition will improve consistency and repeatability of measurements under the DOE test procedure, and would not impact measured values.

Fourth, the 2020 version of ANSI C82.6 added requirements pertaining to stabilization. The updated standard includes a requirement in the alternative stabilization method that lamps used for testing should be stable. Using a stable lamp in a test would be considered industry “best practice,” but was not specified as a requirement in ANSI C82.6-2005 or the DOE test procedure. The alternative stabilization method is used when it is not possible to keep the lamp from extinguishing, as required in the basic stabilization method. DOE has tentatively determined that, if incorporated, the lamp stability requirement would provide helpful specificity in the alternative stabilization method.

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<sup>17</sup> This document was submitted to the docket of DOE's rulemaking to review energy conservation standards for fluorescent lamp ballasts (Docket No. EERE-2008-BT-TP-0017).

ANSI C82.6-2015 (R2020) also defines the term “operational stability” in the alternative stabilization method as when three consecutive measurements of the lamp’s electrical characteristics are within 2.5 percent of the preceding measurement over a five minute period. DOE’s test procedure requires only lamp power, rather than all lamp electrical characteristics, be within 2.5 percent of the preceding measurement. DOE has tentatively determined that the updated definition of “operational stability,” if incorporated, would improve testing consistency and repeatability when using the alternative stabilization method, and would not impact measured values. (See section III.D.2.a for further details on clarifications to stabilization criteria in DOE’s test procedure.)

Fifth, the 2020 version of ANSI C82.6 added a requirement that electronic HID ballasts must be measured with digital instruments. DOE has tentatively determined that, if incorporated, measuring electronic HID ballasts with digital instruments would improve consistency and repeatability of measured values, and would not impact measured values.

Sixth, the 2020 version of ANSI C82.6 updates the list of pertinent measurements for electronic and magnetic ballasts. Additional measurements applicable to both electronic and magnetic ballasts include those pertaining to: (1) extinction voltage and (2) application requirements - end of life. Additional measurements applicable only to electronic ballasts include: (1) inrush current; (2) hot re-strike time; (3) starting time; (4) power regulation; (5) rise and fall time; and (6) lamp stability. The DOE test procedure requires measurements to determine ballast efficiency (*i.e.*, ballast input power, lamp output power). DOE has tentatively determined that because the additional measurements listed in ANSI C82.6-2015 (R2020) are not necessary to determine ballast efficiency, they are not required by the DOE test procedure and, therefore, will not impact measured values.

Seventh, the 2020 version of ANSI C82.6 includes new sections that specify instrumentation to use and how to take measurements when measuring input current; current total harmonic distortion (“THD”); input power; and lamp voltage, current, and power for determining lamp operating limits. Specifications on taking these measurements for modulated signals were also added. DOE has tentatively determined that, if incorporated, updated instructions on measuring input current THD, input power, and lamp voltage, lamp current, and lamp power in ANSI C82.6-2015 (R2020) would improve consistency and repeatability of measured values, and would not impact measured values under the DOE test procedure.

Eighth, the 2020 version of ANSI C82.6 added an equation specifying that ballast efficiency is the reference lamp power divided by the ballast input power. The DOE test procedure specifies that ballast efficiency is calculated by dividing the measured lamp output power by the measured ballast input power. Hence, DOE has tentatively determined that because the added equation in ANSI C82.6-2015 (R2020) is the same as DOE’s current ballast efficiency equation, it reaffirms the DOE test procedure.

At the time of the publication of the May 2018 RFI, the most recent available version of ANSI C82.6 was a 2015 version of the standard.<sup>18</sup> Hence, in the May 2018 RFI, DOE asked for comment on the potential impact of incorporating by reference ANSI C82.6-2015 and any potential differences in testing under the 2015 version of ANSI C82.6, as compared to the 2005 version. 83 FR 24682. In response to DOE’s request, NEMA commented that no adverse effects would be expected from adopting this revised edition of ANSI C82.6. NEMA noted that the changes build upon the previous version by widening its scope to include low-frequency square wave electronic ballasts and providing clarifications to the standard. NEMA cited as

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<sup>18</sup> American National Standards Institute. American National Standard for Lamp Ballasts — Ballasts for High-Intensity Discharge Lamps – Methods of Measurement. Approved February 20, 2015.

enhancements to the standard the revised description of the alternative stabilization method for electronic ballasts; the requirement for the exclusive use of digital instruments with electronic ballasts; and the addition of a ballast efficiency calculation as enhancements to the standard.

(NEMA, No. 2 at p. 5)

DOE has determined that there are no differences between the 2020 version and the 2015 version of ANSI C82.6 and that the 2020 version is a reaffirmation of the 2015 version. Hence, NEMA's comments on the 2015 version are also applicable to the 2020 version of ANSI C82.6. DOE agrees with NEMA that adopting the updated ANSI C82.6 standard should not cause any adverse effects on testing. DOE has tentatively determined that the changes discussed do not result in substantive changes to test setup and methodology, and would not affect measured values. For the reasons discussed in this section, DOE proposes to incorporate by reference the 2020 version of ANSI C82.6. DOE requests comment on its proposal to incorporate by reference ANSI C82.6-2015 (R2020) into the DOE test procedure.

## 2. ANSI C78.43

ANSI C78.43 is an industry standard that sets forth the physical and electrical characteristics for single-ended metal halide lamps operated on 60 Hertz ("Hz") ballasts. As discussed in the May 2018 RFI, upon reviewing the current test procedure, DOE found that this industry standard, referenced in the DOE definition of "ballast efficiency," has been updated. 83 FR 24682. Per DOE regulations, "ballast efficiency," or the efficiency of a lamp and ballast combination, is defined as the measured operating lamp wattage (*i.e.*, output power) divided by the measured operating input wattage (*i.e.*, input power), expressed as a percentage. 10 CFR 431.322. The input and output power of the ballast must be measured while the ballast is operating a reference lamp. The 2004 version of ANSI C78.43 (ANSI C78.43-2004) is incorporated by reference in DOE's regulations to describe the requirements for various fixture

components used when measuring ballast efficiency. *See* 10 CFR 431.323. Specifically, the definition of “ballast efficiency” states that the lamp and capacitor (when provided) must constitute a nominal system in accordance with ANSI C78.43-2004. However, the standard does not define the term “nominal system.” ANSI C78.43-2004 does contain the physical and electrical requirements that single-ended metal halide lamps operated on 60 Hz ballasts must meet to qualify as reference lamps.

In the May 2018 RFI, DOE requested comment on the potential impact of adopting the 2013 version of ANSI C78.43. 83 FR 24682. However, an updated version of ANSI C78.43 (ANSI C78.43-2017), which compared to ANSI C78.43-2013 added new lamp datasheets, was published in April 2018. Compared to the 2013 version, the changes in ANSI C78.43-2017, are mainly updates to certain lamp datasheets related to lamp designations, physical descriptions of lamps, and minor changes to test parameters. These new datasheets in ANSI C78.43-2017 incorporate datasheets for additional lamp types which, if adopted, would provide characteristics for additional reference lamps to use for testing. The lamp datasheets provide the physical and electrical characteristics for specific lamps. Ballasts operating the lamps in these newly incorporated datasheets are currently certified in DOE’s Compliance Certification Management System (“CCMS”) database. Hence, these ballasts are already being tested using a certain set of lamp characteristics. Because lamp datasheets are based on industry consensus, it is likely that the characteristics in the new datasheets are the same as those being used in general practice. Therefore, DOE tentatively concludes that adopting the 2017 version of ANSI C78.43 is unlikely to increase testing burden or impact measured values.

In addition, ANSI C78.43-2017 updated existing datasheets with information on magnetic ballast design and electronic low-frequency square wave ballast design. Compared to the 2013 version, ANSI C78.43-2017 makes minor changes to test parameters in the magnetic

ballast design section and specifies basic ignitor requirements in the electronic low frequency square wave ballast design section. ANSI C78.43-2017 also updated the normative references to remove, add, and replace versions of certain industry standards. Because DOE is proposing to reference ANSI C78.43-2017 only when specifying requirements for reference lamps, only parameters that impact the reference lamp such as reference ballast characteristics and values for 100-hour rated lamp wattage, current, and voltage would impact ballast efficiency. None of these parameters are changed in the revisions found in ANSI C78.43-2017. Therefore, DOE has determined that the additional information in ANSI C78.43-2017 for electronic low-frequency square wave ballast design will not affect measured values for ballast efficiency.

In response to the May 2018 RFI, NEMA suggested that DOE incorporate by reference the 2017 version of ANSI C78.43 rather than the 2013 version since the 2017 version included additional lamp types. NEMA concluded that no negative impact was expected from adopting ANSI C78.43-2017. (NEMA, No. 2 at p. 5)

DOE agrees that ANSI C78.43-2017 should be incorporated by reference. DOE has tentatively determined that revisions reflected in ANSI C78.43-2017 would not result in a change in measured values under the test procedure, and the additional datasheets provide characteristics for additional reference lamps to use for testing, thus improving consistency and repeatability of the DOE test procedure. DOE has also tentatively determined that the minor updates to existing datasheets would not result in changes to test setup or methodology. To align with the latest version of the industry standard, DOE proposes to incorporate by reference ANSI C78.43-2017. DOE requests comment on its proposal to incorporate by reference ANSI C78.43-2017 into the DOE test procedure.

In addition to specifying reference lamps in the DOE test procedure, ANSI C78.43 appears as a reference in the definition of “ballast efficiency” in DOE’s regulations at 10 CFR 431.322. Specifically, the definition states that a lamp and capacitor, if one is present, constitutes a nominal system in accordance with ANSI C78.43. In the May 2018 RFI, DOE requested comment on clarifying the term “nominal system.” 83 FR 24682. In response, NEMA stated it was unclear how ANSI C78.43 can be used in the definition of “ballast efficiency.” Further, NEMA commented that the term “nominal system” is not defined in any edition of ANSI C78.43, but the term could be enhanced by specifying that the efficiency of a metal halide ballast be measured according to test methods described in ANSI C82.6-2015. NEMA added that this industry standard requires the use of (1) a stable, low impedance input voltage, per section 4.1; (2) a nominal (electrical) system voltage (“V”) as described in the Metal Halide Luminaire rule<sup>19</sup> (such as 277 V); (3) a stable lamp, per section 4.4.1 and 4.4.2; and (4) a capacitor (if provided) that shall not deviate more than 3 percent from its nominal value. (NEMA, No. 2 at p. 6)

DOE tentatively concludes that a reference to the currently referenced 2004 version or the most recent 2017 version of ANSI C78.43 for the requirements of a “nominal system” within the definition of “ballast efficiency” at 10 CFR 431.322 may result in confusion since the term “nominal system” is not defined within either version of the standard. DOE appreciates NEMA’s suggestion for enhancing the term “nominal system” by specifying that ballast efficiency be measured according to requirements in ANSI C82.5-2015. However, in this NOPR, DOE is already applying NEMA’s suggestion by proposing to reference ANSI C82.6-2015 (R2020) for test conditions and stabilization (see sections III.D.1.a and III.D.2.a, respectively) in the DOE test procedure. Further NEMA’s suggested specifications are not

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<sup>19</sup> NEMA was likely referring to paragraph (b)(1)(iii) of Title 10 of the Code of Federal Regulations (CFR) part 431, subpart S, §431.324 (“Uniform test method for the measurement of energy efficiency and standby mode energy consumption of metal halide lamp ballasts”).

appropriate for 10 CFR 431.322, which specifies only definitions. Therefore, DOE proposes to remove the statement referencing “nominal system” and ANSI C78.43 since the test procedure in its entirety outlines the system requirements when testing the ballast efficiency of a metal halide lamp ballast. See section III.F for a complete description of DOE’s proposed changes to the definition of “ballast efficiency.”

In summary, DOE is proposing to incorporate by reference ANSI C78.43-2017 in the DOE test procedure found at 10 CFR 431.324, but remove the reference to ANSI C78.43 from the definitions found at 10 CFR 431.322.

### 3. ANSI C78.44 and ANSI C82.9

As stated previously, DOE is proposing to incorporate by reference two new industry standards in the active mode test procedure for MHLFs. In particular, ANSI C78.44-2016 specifies the physical and electrical requirements for double-ended metal halide lamps operated on 60 Hz ballasts. Metal halide ballasts are tested with lamps that should adhere to physical and electrical specifications. These specifications are provided in ANSI C78.43 for single-ended metal halide lamps and in ANSI C78.44 for double-ended metal halide lamps. The current DOE test procedure incorporates ANSI C78.43-2005 as a reference for single-ended metal halide lamps but does not reference any version of ANSI C78.44. DOE has tentatively determined that it is necessary to reference ANSI C78.44-2016 for double-ended metal halide lamps. DOE has also tentatively determined that the inclusion of ANSI C78.44-2016 would ensure that necessary specifications are being provided for testing metal halide ballasts that operate double-ended metal halide lamps. DOE requests comment on its proposal to incorporate by reference ANSI C78.44-2016 into the DOE test procedure.



DOE proposes to specify that the metal halide lamps used for testing must meet the definition of a reference lamp as defined by ANSI C82.9-2016. The definition specifies the lamp be seasoned for 100 hours, a requirement that is already in the current DOE test procedure. In addition, the definition of reference lamp in ANSI C82.9-2016 states that a reference lamp has electrical characteristics within +/- 2 percent of the rated values. Industry is likely already adhering to stipulations for reference lamps as specified in ANSI C82.9-2016. Specifying that reference lamps meet the definition in ANSI C82.9-2016 would provide an industry reference for the current seasoning requirement and ensure that industry-accepted requirements are followed when identifying a reference lamp. Therefore, DOE proposes to incorporate by reference ANSI C82.9-2016 in 10 CFR 431.323. DOE requests comment on its proposal to incorporate by reference ANSI C82.9-2016 into the DOE test procedure.

#### 4. IEC 62301

As discussed in section I.A, EPCA directs DOE to amend its test procedures for all covered products to incorporate a measure of standby mode and off mode energy consumption, taking into consideration the most recent versions of IEC 62301 and IEC 62087, if technically feasible. (42 U.S.C. 6295(gg)(2)) Thus, the 2010 MHLF TP final rule established a test method for measuring standby mode power (42 U.S.C. 6295(gg)(2)(A)). 75 FR 10950, 10959-10961. DOE developed the standby mode test method for metal halide lamp ballasts to be consistent with the industry standard IEC 62301:2005<sup>20</sup> but also referenced language and methodologies presented in ANSI C82.6-2005. 75 FR 10951. To improve the clarity of the standby mode test method, DOE proposes to directly incorporate by reference the most recent version, IEC Standard 62301:2011 for measuring the energy consumption of MHLFs in standby mode. (See section III.E for more information.)

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<sup>20</sup> International Electrotechnical Commission. Household electrical appliances – Measurement of standby power (Edition 1.0). Published June 13, 2005.

#### D. Proposed Amendments to Active Mode Test Method

As a result of DOE's proposed amendments to the active mode test method discussed in this section, DOE is proposing modifications to both the active mode test method and the organization of 10 CFR 431.324 to improve readability. Specifically, DOE is proposing changes to the test conditions and setup, as well as the test method for the measurement of ballast efficiency of MHLFs. DOE also proposes to state that the language in 10 CFR 431.324 would take precedence if there is a conflict between referenced industry standards and the revised DOE test procedure. DOE requests comment on both the general instructions of the active mode test method and the proposed modifications to the organization of 10 CFR 431.324. DOE discusses the proposed amendments to the active mode test method in greater detail in the sections that follow.

##### 1. Test Conditions and Setup

DOE proposes to amend the test conditions and setup paragraph of the active mode test procedure in 10 CFR 431.324 to: (1) more accurately reference industry standards and the relevant sections of those standards; (2) provide direction for testing metal halide lamp ballasts that operate lamps of different wattages or lamp types; and (3) specify testing of dimming metal halide lamp ballasts at maximum input power. DOE is proposing to revise the heading of paragraph (b)(1)(i) of existing 10 CFR 431.324 from "Test Conditions" to "Test Conditions and Setup" and redesignate it as paragraph (b)(2) of the revised 10 CFR 431.324 to align with proposed additions to this paragraph (b) pertaining to test setup. DOE has tentatively determined that the proposed updates pertaining to test conditions and setup would not change measured values used for certifying compliance with existing energy conservation standards for MHLFs. The specific changes are discussed in further detail in the sections that follow.

#### a. General Test Conditions

Paragraph (b)(1)(i) of 10 CFR 431.324 currently references section 4.0, “General Conditions for Electrical Performance Tests,” of ANSI C82.6 for power supply, ballast test conditions, lamp position, lamp stabilization, and test instrumentation. DOE proposes to remove lamp stabilization from the description of test conditions because lamp stabilization is part of the test method rather than a test condition, and to better align the test procedure with the organization of the updated ANSI C82.6 standard. DOE proposes to include instructions for the lamp stabilization process in the test method paragraph of 10 CFR 431.324 and discusses these proposed changes in section III.D.2. Under this paragraph, DOE proposes to include specification that the circuits used for testing must be in accordance with the circuit connections set forth in section 6.3 of ANSI C82.6.

#### b. Dimming Ballasts

DOE established an active mode test method in the 2010 MHLF TP final rule which incorporated relevant sections of ANSI C82.6-2005 to measure ballast efficiency as required by EPCA (42 U.S.C. 6293(b)(18)). 75 FR 10950. DOE also clarified in the 2010 MHLF TP final rule that active mode applies to a functioning ballast operating with any amount of rated system light output (*i.e.*, greater than zero percent), and noted that if a ballast is dimmed (*i.e.*, operating the light source at more than zero percent, but less than 100 percent), the lamp and the ballast are both still in active mode. 75 FR 10953. DOE notes that in the case of dimming ballasts, where input power can vary, a specification regarding how to test these ballasts is necessary. DOE requested comment in the May 2018 RFI on whether it is common industry practice to test dimming metal halide ballasts at 100 percent light output. 83 FR 24682.

NEMA responded that dimmable HID ballasts are commonly tested while operating at maximum light output, but also added that most HID ballasts are not dimmable. (NEMA, No. 2

at p. 6) DOE agrees that the market for dimmable metal halide ballasts is small. Consistent with NEMA's comment, DOE is clarifying testing requirements for such ballasts by proposing that dimming metal halide lamp ballasts must be tested when operating at the maximum input power. DOE requests comment on the proposal to specify that dimming metal halide lamp ballasts be tested at maximum input power.

#### c. Reference Lamps

MHLFs must be tested for ballast efficiency while operating reference lamps. In the May 2018 RFI, DOE requested comment on the availability of reference lamps. 83 FR 24682. NEMA responded that metal halide lamps are not sold as reference lamps; however, a small percentage of regular metal halide lamps can meet the reference lamp specifications. NEMA added that the quantity of potential reference lamps available is adequate since the demand for reference lamps is low due to limited product development and testing. (NEMA, No. 2 at p. 5)

DOE appreciates NEMA's confirmation that the availability of reference lamps for metal halide ballast testing is sufficient, and DOE is proposing several additions to the test conditions and setup paragraph of 10 CFR 431.324 to clarify the selection of metal halide lamps used in testing metal halide lamp ballasts. Metal halide lamp ballasts are to be tested with reference lamps. ANSI C82.9-2016 provides definitions related to specific terms used in industry standards for HID lamps and ballasts. Thus, DOE proposes to specify that the metal halide lamps used for testing must meet the definition of a reference lamp as defined by ANSI C82.9-2016. In addition, ANSI C78.43-2017 and ANSI C78.44-2016 specify the physical and electrical requirements that single-ended and double-ended metal halide lamps operated on 60 Hz ballasts must meet to qualify as reference lamps. Therefore, DOE proposes that the metal halide lamps used for testing must also be within the acceptable range for a reference lamp of the rated values

specified in ANSI C78.43-2017 and ANSI C78.44-2016 for single-ended metal halide lamps and double-ended metal halide lamps, respectively.

DOE also requested comment in the May 2018 RFI on the prevalence of metal halide ballasts capable of operating more than one lamp wattage, and how this equipment should be tested. 83 FR 24682. NEMA responded that metal halide ballasts capable of operating more than one lamp wattage make up a very small and decreasing fraction of the market, and that they should not be added to the scope of the regulation. NEMA noted that HID ballasts are tested with their corresponding lamps, and that ballasts capable of operating multiple lamp wattages would be tested with multiple lamps. (NEMA, No. 2 at p. 6)

DOE notes that metal halide ballasts capable of operating multiple lamp wattages currently fall within multiple basic models. No specification regarding the reference lamp to be used in testing metal halide lamp ballasts, pertaining to either lamp wattage or lamp type, is currently provided in 10 CFR 431.324. Thus, DOE is proposing revisions to the test procedure to clarify the wattage and type of reference lamp to be used for testing.

Section 6.18 of ANSI C82.6-2015 (R2020) states that, if a ballast can operate multiple lamp types, some (unspecified) regulations require that a ballast be tested with the highest lamp power specified by the manufacturer. Based on a recent survey of the market, DOE identified metal halide lamp ballasts that may be able to operate lamps of different wattages (*e.g.*, a ballast that can operate a 70 W lamp or 100 W lamp). Thus, DOE is proposing to add the requirement to 10 CFR 431.324 that metal halide lamp ballasts designated with ANSI codes corresponding to more than one lamp must be tested with the lamp having the highest nominal lamp wattage as specified in ANSI C78.43-2017 or ANSI C78.44-2016, as applicable. DOE also found some ballasts that can operate both ceramic metal halide lamps and quartz metal halide lamps. Based

on data collected for DOE's HID lamps final rule determination published on December 9, 2015 (80 FR 76355),<sup>21</sup> DOE has tentatively determined that quartz metal halide lamps are more popular than ceramic metal halide lamps. Thus, DOE is proposing to add a requirement to 10 CFR 431.324 that ballasts designated with ANSI codes corresponding to both ceramic metal halide lamps (code beginning with "C") and quartz metal halide lamps (code beginning with "M") of the same nominal lamp wattage must be tested with the quartz metal halide lamp. DOE requests comment on the proposed requirements for selecting reference lamps for ballasts capable of operating lamps of different wattages or lamp types, and specifically the proposals to test with the highest lamp wattage and to test with quartz metal halide lamps.

## 2. Test Method

DOE proposes to amend the test method paragraph of the active mode test procedure at 10 CFR 431.324 to: (1) specify lamp stabilization criteria for testing; (2) more accurately reference industry standards and the relevant sections of those standards; and (3) include requirements for ballast efficiency calculations. Specifically, DOE is proposing to add paragraphs to the test method paragraph describing requirements for lamp stabilization, test measurements, and calculations. As discussed in further detail, DOE is also proposing to revise the heading of paragraph (b)(2) of 10 CFR 431.324 from "Test Measurement" to "Test Method" and redesignate it as paragraph (b)(3) to align with the proposed revisions to this paragraph (b). In addition, DOE is proposing to add the ballast efficiency calculation contained in paragraph (b)(3) of existing 10 CFR 431.324 to the "Test Method" section to improve organization.

### a. Stabilization Criteria

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<sup>21</sup> U.S. Department of Energy—Office of Energy Efficiency and Renewable Energy. Energy Conservation Program for Consumer Equipment: Final Determination: High-Intensity Discharge Lamps. 2015. Washington, D.C. Available at: <https://www.regulations.gov/docket?D=EERE-2010-BT-STD-0043>.

DOE proposes to clarify the requirements for lamp stabilization found at 10 CFR 431.324. Specifically, DOE proposes to directly reference sections 4.4.2 and 4.4.3 of ANSI C82.6-2015 (R2020) for the basic stabilization method and the alternative stabilization method, respectively. As discussed in section III.C, the current DOE test procedure contains explicit instructions for both the lamp stabilization methods rather than referencing the relevant sections of the industry standard. At the time of the previous rulemaking, NEMA provided the then-anticipated changes to the updated version of ANSI C82.6. Because the lamp stabilization methods are now contained in ANSI C82.6-2015 (R2020), DOE proposes to reference the relevant sections, sections 4.4.2 and 4.4.3. DOE, however, proposes to maintain the lamp stability criteria for the basic stabilization method currently found at 10 CFR 431.324, as the method in ANSI C82.6-2015 (R2020) is more ambiguous and may not be practical. ANSI C82.6-2015 (R2020) states that stabilization is determined by operating the lamp within 3 percent of its rated wattage in the specified ambient temperature until the electrical parameters “cease to change.” DOE determined that the existing lamp stability criteria in 10 CFR 431.324, which states that stabilization is reached when the lamp’s electrical characteristics vary by no more than 3 percent in three consecutive 10 to 15 minute intervals, is more specific. DOE has determined that the verbiage “cease to change” in the updated ANSI stability criteria would be nearly impossible to meet, as electrical parameters are expected to change by a small percentage after each measurement. DOE has tentatively determined that these proposed updates would not change measured values, as the lamp stabilization procedures are consistent with the methods in the existing DOE test procedure, and DOE is simply replacing these methods with references to the appropriate sections of ANSI C82.6-2015 (R2020). DOE requests comment on the proposal to directly reference the basic stabilization method section and alternative stabilization method sections of ANSI C82.6-2015 (R2020). DOE also requests comment on its proposal to retain the lamp stability criteria for the basic stabilization method, as currently set forth in the DOE test procedure.

#### b. Test Measurements

DOE proposes additional updates to 10 CFR 431.324 to more closely align regulations with the updated ANSI C82.6 standard. DOE proposes to remove the general reference to section 6 of ANSI C82.6 and specifically reference sections 6.1 and 6.8 of ANSI C82.6-2015 (R2020) for measuring ballast input power, and sections 6.2 and 6.10 of ANSI C82.6-2015 (R2020) for measuring lamp output power. DOE is simply providing references to the subsections within section 6 of ANSI C82.6-2015 (R2020) that are specific to the value being measured instead of referencing the general section. DOE expects that these updates would further clarify the test procedure and not change measured values.

#### c. Calculations

DOE proposes minor changes to the organization of 10 CFR 431.324, used to calculate ballast efficiency, which is the measured lamp output power divided by the measured ballast input power. Specifically, in the ballast efficiency calculation description, DOE proposes to reference the sections in the DOE test procedure that specify how to measure ballast input power and ballast output (lamp) power. DOE has tentatively determined that these updates would serve only as a clarification of the ballast efficiency calculation and would not affect measured values.

#### d. High-Frequency Electronic Ballasts

The current test procedure incorporates by reference ANSI C82.6-2005 for testing both electronic and magnetic metal halide ballasts. However, neither ANSI C82.6-2005 nor the revised 2020 version provide a method specifically for testing high-frequency electronic (“HFE”) ballasts. A HFE metal halide ballast is defined by DOE as an electronic ballast that operates a lamp at an output frequency of 1000 Hz or greater. 10 CFR 431.322. In the 2013 MHLF energy conservation standards NOPR, DOE considered adopting procedures for testing



HFE ballasts based on the instrumentation used for testing high frequency electronic fluorescent lamp ballasts. 78 FR 51464, 51480-51481 (Aug. 20, 2013). However, in the 2014 MHLF energy conservation standards final rule, DOE declined to amend the test procedure to include a procedure for HFE ballasts due to the lack of industry specifications for reference lamps to be paired with the ballasts during testing and the lack of a complete industry test method specific to HFE ballasts. 79 FR 7758 (Feb. 10, 2014).

Subsequently, an ANSI standard for HFE metal halide ballasts titled ANSI C82.17-2017, “High Frequency (HF) Electronic Ballasts for Metal Halide Lamps,” (ANSI C82.17-2017) was published. ANSI C82.17-2017 provides specifications for and operating characteristics of HFE metal halide ballasts with sinusoidal lamp operating current frequencies above 40 kilohertz (“kHz”). ANSI C82.17-2017 also states in section 5.1 that “all measurements necessary to determine compliance with the ballast performance requirements of this standard shall be made in accordance with ANSI C82.6.” Based on DOE’s initial review, the specifications and instructions in ANSI C82.6 cover the necessary methodology, while being general enough to be used as a guide for taking measurements of HFE ballasts.

In the May 2018 RFI, DOE requested comment on the impact of incorporating by reference ANSI C82.17-2017, and whether it would provide repeatable and reproducible results when paired with ANSI C82.6-2015 for the testing of HFE metal halide ballasts. 83 FR 24683.

In response, NEMA noted that ANSI standards represent the most effective, repeatable test procedures possible, but that there is administrative burden associated with implementing these standards. Specifically, NEMA cited several challenges associated with incorporating ANSI C82.17-2017 for testing HFE metal halide ballasts, including: (1) few, if any, HFE metal halide reference ballasts exist and no design standard exists; (2) limited industry resources are

available to develop a HFE reference ballast design standard due to increased focus on LED technology; (3) repeatability issues exist unless high frequency reference ballasts become commonly available; and (4) costs are associated with additional National Voluntary Laboratory Accreditation Program (“NVLAP”) certifications. (NEMA, No. 2 at p. 7)

DOE appreciates NEMA’s feedback on the challenges associated with incorporating ANSI C82.17-2017 for testing HFE ballasts. DOE agrees that the lack of a HFE reference ballast design standard and the absence of HFE reference ballast specifications in ANSI C78.43-2017 and ANSI C78.44-2016 could cause repeatability issues when testing HFE metal halide ballasts. Therefore, DOE is not proposing to incorporate by reference ANSI C82.17-2017 or to include a test method for HFE metal halide ballasts in the proposed revisions to its test procedure. DOE will continue to monitor the development of HFE reference ballast design standards and HFE reference ballast specifications for metal halide lamps, and may consider revising the test procedure in the future. Costs associated with the proposed revisions to the test procedure, including NVLAP certification, are discussed in detail in section III.H.1 of this document.

DOE also requested comment in the May 2018 RFI on whether manufacturers and laboratories test HFE metal halide ballasts using the same instrumentation as they use for testing electronic fluorescent lamp ballasts. 83 FR 24683. NEMA responded that the instrumentation used is similar, but does not exactly align due to major differences in the level of power consumption between the technologies. NEMA noted that differences between HFE metal halide ballasts and high frequency electronic fluorescent lamp ballasts in the frequency bands, current, voltage, power ranges, and starting modes require separate, high-capacity equipment for HFE metal halide ballasts. (NEMA, No. 2 at p. 7) As discussed previously in this section, DOE

is not proposing a test method for HFE metal halide ballasts at this time due to the lack of HFE reference ballast design standard and HFE reference ballast specifications for metal halide lamps.

#### E. Proposed Amendments to Standby Mode Test Method

EPCA directs DOE to establish test procedures to include standby mode energy consumption, taking into consideration the most current versions of Standards 62301 and 62087 of the International Electrotechnical Commission. (42 U.S.C. 6295(gg)(2)(A)) IEC Standard 62087 applies only to audio, video, and related equipment, and does not apply to lighting products. DOE proposes to incorporate by reference IEC 62301:2011, which although not specifically addressing lighting products, applies generally to household electrical appliances which include lighting products. The current test procedure requires measuring standby mode energy consumption following provisions of ANSI C82.6-2005, the same industry standard that is incorporated into DOE's current active mode test procedure. However, while ANSI C82.6-2005 is not specific to standby mode energy consumption measurements, IEC 62301:2011 does provide requirements for measuring standby mode energy consumption.

In the May 2018 RFI, DOE requested comment on the potential impact of incorporating by reference IEC 62301:2011, the most recent version of the standard, in an amended test procedure for measuring standby mode power. 83 FR 24683. NEMA stated that the IEC 62301:2011 standard is not applicable to HID lamp ballasts. (NEMA, No. 2 at p. 6) DOE refers NEMA to section 1 of IEC 62301:2011, which states that the standard is "applicable to electrical products with a rated input voltage or voltage range that lies wholly or partly in the range 100 V of alternating current ("A.C.") to 250 V A.C. for single phase products, and 130 V A.C. to 480 V A.C. for other products." Section 1 of IEC 62301:2011 also states that the term "products" refers to "energy using products such as household appliances or other equipment within the scope of

TC 59<sup>22</sup>” but notes that the measurement methodology could be applied to other products. Metal halide ballasts are electrical products that operate at voltages that fall within the scope of IEC 62301:2011. Further DOE has determined that instructions and criteria specified in IEC 62301:2011 for stabilization and subsequent measurement of standby mode power consumption are applicable to metal halide lamp ballasts.

NEMA also commented that metal halide lamp ballasts capable of operating in standby mode are uncommon, and thus, modifications to the standby mode test method are unnecessary. (NEMA, No. 2 at p. 6) DOE conducted a survey of the market and agrees that metal halide ballasts capable of operating in standby mode are uncommon. As discussed in section III.C.4, DOE is required by EPCA to incorporate a measure of standby and off mode energy consumption in accordance with IEC 62301 and IEC 62087, if technically feasible. (42 U.S.C. 6295(gg)(2)) Therefore, because DOE deems it to be technically feasible, DOE is proposing to incorporate by reference specific sections of IEC 62301:2011 for measuring the energy consumption of MHLFs capable of operating in standby mode. DOE notes that the proposed revisions to the existing standby test method will improve clarity by replacing the currently referenced industry standard (ANSI C82.6-2005) with one that addresses standby mode power consumption (IEC 62301:2011) and better align with the requirements of EPCA and the standby mode test methods for other lighting products.

In addition, as a result of DOE’s proposed amendments to the standby mode test method discussed in the preceding paragraphs, DOE is proposing modifications to the organization and wording of paragraph (c) in 10 CFR 431.324 to improve readability. Specifically, DOE proposes to modify the general instructions of the standby mode test method found in existing paragraph

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<sup>22</sup> Information regarding IEC TC 59—Performance of household and similar electrical appliances, can be found at [https://www.iec.ch/dyn/www/f?p=103:7:10591261086280:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1275,25](https://www.iec.ch/dyn/www/f?p=103:7:10591261086280:::FSP_ORG_ID,FSP_LANG_ID:1275,25)

(c) to clarify that standby mode energy consumption need only be measured for ballasts capable of operating in standby mode. DOE also proposes to state that the language in 10 CFR 431.324 would take precedence if there is a conflict between IEC 62301:2011 and the language in the revised DOE test procedure. DOE requests comment on the proposed modifications to the organization and the general instructions of the standby mode test method in 10 CFR 431.324(c). DOE discusses the proposed amendments to the standby mode test method in greater detail in the sections that follow.

## 1. Test Conditions and Setup

Both the active mode and standby mode test procedures measure input power of the ballast. As such, for consistency within the test procedure and to reduce the test burden, DOE proposes requiring similar general test conditions and setup for both tests. To align the test conditions and setup requirements for the active and standby modes, DOE proposes to modify the test conditions and setup paragraph in the standby mode test procedure with the following directions: (1) test conditions and setup must be in accordance with the active mode test procedure and (2) each ballast must be operated with a lamp as specified in the active mode test procedure, except that the use of a reference lamp is not required. Because lamps are not turned on during the measurement of standby mode power consumption, DOE has tentatively determined that whether the lamp to which the ballast is connected is a reference lamp does not impact standby mode energy consumption measurements. In addition, DOE proposes to revise the heading “Test Conditions” of paragraph (c)(1) of existing 10 CFR 431.324 to “Test Conditions and Setup” to reflect these changes.

DOE requests comment on referencing the active mode test method section in the test conditions and setup requirements for the standby mode test method and for the connection of lamps (with the exception of reference lamp requirements).

## 2. Test Method and Measurement

DOE also proposes to replace the paragraphs of existing 10 CFR 431.324 pertaining to standby mode measurements. DOE proposes to add a new paragraph with the heading “Test Method and Measurement,” containing specific instructions related to the measurement of standby mode energy consumption. DOE proposes to: (1) add instructions to turn on, at full light output, the lamp to which the ballast is connected to ensure the ballast is not defective and (2) require ballast stabilization and that subsequent measurement of standby mode energy consumption be conducted according to the measurements section of IEC 62301:2011 (*i.e.*, section 5). DOE has tentatively determined that the instructions and criteria specified for stabilization and measurement of standby mode power consumption in section 5 of IEC 62301:2011 are appropriate for MHLFs. DOE requests comment on referencing section 5 of IEC 62301:2011 for stabilization and standby mode energy consumption measurements. In addition, DOE requests comments on proposed instructions regarding turning on the lamp to ensure the ballast is not defective. Finally, DOE requests comment on the test burden and impact on the energy use measurement during a representative average use cycle or period of use associated with the proposed modifications to the measurement of standby mode power in the DOE test procedure.

### F. Definitions

DOE proposes to define several terms in 10 CFR 431.322 pertaining to the proposed test specifications for reference lamps used in testing (see section III.D.1 for greater detail). DOE proposes to define the term “reference lamp” as a lamp that meets the operating conditions of a reference lamp as defined by ANSI C82.9-2016. DOE proposes to define “quartz metal halide lamp” as a lamp with an arc tube made of quartz materials, and “ceramic metal halide lamp” as a lamp with an arc tube made of ceramic materials.

DOE proposes to amend the existing definition for the term “ballast efficiency” in 10 CFR 431.322 by removing clause 3 in the definition which references “nominal system” and ANSI C78.43 since the test procedure in its entirety outlines the system requirements when testing the ballast efficiency of a metal halide lamp ballast. See section III.C.2 for more details. DOE also proposes to remove clauses 4 and 5 in the “ballast efficiency” definition which, respectively, specify for 60 Hz and greater than 60 Hz, input power and output power measurement specifications. DOE proposes to move these requirements to the test procedure found in 10 CFR 431.324 because they describe the test method.

#### G. Compliance Dates and Waivers

EPCA prescribes that all representations of energy efficiency and energy use, including those made on marketing materials and product labels, must be made in accordance with an amended test procedure, beginning 180 days after publication of such a test procedure final rule in the *Federal Register*. (42 U.S.C. 6293(c)(2)) If DOE were to publish an amended test procedure, EPCA provides an allowance for individual manufacturers to petition DOE for an extension of the 180-day period if the manufacturer may experience undue hardship in meeting the deadline. (42 U.S.C. 6293(c)(3)) To receive such an extension, petitions must be filed with DOE no later than 60 days before the end of the 180-day period and must detail how the manufacturer will experience undue hardship. (*Id.*)

Upon the compliance date of an amended test procedure, should DOE issue such an amendment, any waivers that had been previously issued and are in effect that pertain to issues addressed by the amended test procedure are terminated. 10 CFR 430.27(h)(2). Recipients of any such waivers would be required to test the equipment subject to the waiver according to the amended test procedure as of the effective date of the amended test procedure. At present there

are no outstanding waivers that address test procedure issues that would be addressed by the amendments proposed in this document.

## H. Test Procedure Costs, Harmonization, and Other Topics

### 1. Test Procedure Costs, Burdens and Impact

EPCA requires that test procedures proposed by DOE not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) In this NOPR, DOE proposes to amend the existing test procedure for metal halide lamp ballasts by (1) updating references to industry standards; (2) clarifying the selection of reference lamps to be tested with metal halide lamp ballasts; (3) reorganizing the content of the test procedure for better readability and clarity; and (4) revising the test procedure for measuring standby mode energy consumption of metal halide lamp ballasts. DOE has tentatively determined that these proposed amendments to the MHLF test procedure would not be unduly burdensome to conduct because they are mainly clarifications to existing requirements.

Moreover, DOE's analysis of this proposal indicates that, if finalized, it would result in neither a reduction of nor an increase in future testing costs.

The proposed amendments would update references within the test procedure to the latest versions of existing industry standards and adding references to new industry standards. The current test procedure for taking active mode measurements to determine ballast efficiency references one industry standard, ANSI C82.6. The proposed amendments update references to ANSI C82.6 from the 2005 version to the 2020 version. In addition, the NOPR proposes to reference three new standards: ANSI C78.44-2016 to incorporate industry-approved lamp characteristics for double-ended metal halide lamps; ANSI C82.9-2016 to incorporate industry-approved definition for reference lamp; and IEC 62301:2011 to incorporate an industry standard



that is specific to standby mode power consumption measurement. In general, these updates only clarify requirements, and do not add complexity to test conditions/setup or add test steps. This NOPR also proposes clarifications regarding the selection of reference lamps to address, in particular, new equipment on the market (*i.e.*, metal halide ballasts that can operate multiple lamp wattages or lamp types). DOE expects that these proposed amendments would provide greater specificity to the test setup instructions.

The proposed revisions to the standby mode test procedure would change the industry standard reference from ANSI C82.6 to IEC 62301:2011, Section 5. The latter industry reference provides more detailed guidance on how to determine the final power consumption value from power readings, but should not add additional steps to obtain power measurements. Additionally, the proposed amendments to the standby mode test procedure align the test setup and test conditions for taking active mode and standby mode measurements. DOE notes that IEC 62301 has already been incorporated in other DOE lighting test procedures. IEC 62301:2011 does not require additional measurements or new instrumentation, and therefore, DOE has tentatively determined its incorporation would not increase test burden.

DOE has tentatively determined that the amendments to DOE's test procedure for measuring ballast efficiency proposed in this NOPR would not require the purchase or use of new or additional equipment or require additional steps for testing measured values. Further, the proposed revisions are not expected to change measured values. Hence, DOE expects that manufacturers will be able to rely on data generated under the previous test procedure. While manufacturers must submit a report annually to certify a basic model's represented values, basic models do not need to be retested annually. The initial test results used to generate a certified rating for a basic model remain valid as long as the basic model has not been modified from the tested design in a way that makes it less efficient or more consumptive, which would require a

change to the certified rating. If a manufacturer has modified a basic model in a way that makes it more efficient or less consumptive, new testing is only required if the manufacturer wishes to make claims of the new, more efficient rating.<sup>23</sup>

In the May 2018 RFI, DOE requested information that would help DOE create procedures that would limit manufacturer test burden through streamlining or simplifying testing requirements. DOE also requested feedback on any potential amendments to the existing test procedure that could be considered to address impacts on manufacturers, including small businesses. 83 FR 24683.

NEMA commented that there is no benefit to updating the current test procedures for MHLFs, which are well-implemented, well-understood, and adequate to the needs of the environment. NEMA added that updating the test procedures would result in increased burden due to test process provisions, requalification of NVLAP, and training of laboratory personnel. NEMA provided a breakdown of the costs associated with certifying labs to new versions of industry standards and urged DOE to consider these costs for each affected manufacturer laboratory in its manufacturer impact analysis. Specifically, NEMA estimated the NVLAP certification costs for each new standard to be \$15,000; the administrative costs to train personnel on a new DOE test procedure to be \$50,000; and the costs for additional personnel to support a new or revised test procedure to be \$100,000. (NEMA, No. 2 at pp. 7-8)

DOE considered the additional cost burden outlined by NEMA specifically related to NVLAP accreditation costs; administrative costs; and costs for additional personnel. DOE notes that a laboratory gaining accreditation to test MHLFs according to the test procedure in 10 CFR

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<sup>23</sup> See guidance issued by DOE at: [https://www1.eere.energy.gov/buildings/appliance\\_standards/pdfs/cert\\_faq\\_2012-04-17.pdf](https://www1.eere.energy.gov/buildings/appliance_standards/pdfs/cert_faq_2012-04-17.pdf).

431.324 is doing so voluntarily or as required by an entity other than DOE. Accreditation by NVLAP is not required by DOE under 10 CFR part 431 or 10 CFR part 429 for the testing of MHLFs, and therefore does not factor into testing costs associated with DOE's test procedure.

As stated in this NOPR, DOE has tentatively determined that the proposed updates to the current test procedure are minimal and should not result in a change of measured values. With regards to administrative costs cited by NEMA to train personnel on a test procedure, due to the minimal changes, DOE has tentatively determined the proposed amendments will not result in additional workload for testing personnel. Therefore, DOE has tentatively determined the costs associated with training existing personnel to be minimal and the need to hire additional personnel to be unlikely.

NEMA also commented that there are significant costs associated with acquiring instrumentation for the testing of HFE metal halide ballasts, which is an added burden on manufacturers and especially small businesses. NEMA noted that a high frequency power analyzer may cost around \$45,000 and the manufacture or procurement of HFE reference ballasts may be \$5,000. (NEMA, No. 2 at pp. 7-8) As discussed in section III.D.2.d, DOE is not considering a test method for HFE metal halide ballasts, which eliminates the additional costs cited by NEMA for the testing of HFE metal halide ballasts.

NEMA noted in comments made in response to the December 2011 HID lamps test procedure NOPR (HID TP NOPR; 76 FR 77914 (Dec. 15, 2011)) that the cost to test high wattage products is not trivial due to heat output, electricity costs, and personnel safety considerations.<sup>24</sup> NEMA commented that although the duration of metal halide ballast testing is

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<sup>24</sup> See <https://www.regulations.gov/document?D=EERE-2010-BT-TP-0044-0006>.

shorter than the HID lamp lumen maintenance testing considered in the HID TP NOPR,<sup>25</sup> the energy consumption remains significant. NEMA concluded that a complete revision of the metal halide ballast test procedure would result in these non-trivial testing costs being added to the product costs in a declining market. (NEMA, No. 2 at p. 8)

As stated, DOE has tentatively determined that the changes proposed in this NOPR are minor updates to clarify and enhance the test procedure, and would not result in a change in measured values. Further, DOE is not proposing a test method for HFE metal halide ballasts in this NOPR, so the proposed amendments would not change the scope of the test procedure. For these reasons, the proposed updated test procedure would not increase test costs for manufacturers.

## 2. Harmonization with Industry Standards

DOE's established practice is to adopt relevant industry standards as DOE test procedures unless such methodology would be unduly burdensome to conduct or would not produce test results that reflect the energy efficiency, energy use, water use (as specified in EPCA), or estimated operating costs of that product during a representative average use cycle. Section 8(c) of appendix A to 10 CFR part 430 subpart C. In cases where the industry standard does not meet EPCA statutory criteria for test procedures DOE will make modifications through the rulemaking process to these standards as the DOE test procedure.

The test procedure for metal halide lamp ballasts at §431.324 incorporates by reference several industry standards. DOE proposes to incorporate by reference ANSI C78.43-2017, ANSI C78.44-2016, ANSI C82.6-2015 (R2020), ANSI C82.9-2016, and IEC 62301:2011 in their

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<sup>25</sup> U.S. Department of Energy–Office of Energy Efficiency and Renewable Energy. Energy Conservation Program for Consumer Equipment: Notice of Proposed Rulemaking: Test Procedures for High-Intensity Discharge Lamps. 2011. Washington, D.C. Available at: <https://www.regulations.gov/document?D=EERE-2010-BT-TP-0044-0001>

entirety. The industry standards DOE proposes to incorporate by reference via amendments described in this NOPR are discussed in further detail in section IV.M.

DOE requests comment on the benefits and burdens of adopting any industry/voluntary consensus-based or other appropriate test procedure, without modification. DOE also seeks comment on whether there are any further changes to the Federal test method that would provide additional benefits to the public.

### 3. Other Test Procedure Topics

In the May 2018 RFI, in addition to the issues identified earlier in this document, DOE welcomed comment on any other aspect of the existing test procedure for metal halide lamp ballasts not already addressed by the specific areas identified in the document. In particular, DOE requested information that would assist DOE in assuring that the test procedure is reasonably designed to produce results that measure the energy use or energy efficiency of the products during a representative average use cycle or period of use. DOE also requested information that would improve the repeatability and reproducibility of the test procedure. 83 FR 24683. NEMA commented that incorporating ANSI C82.6-2015 would ensure the repeatability and reproducibility of test results, but noted that it was unaware of studies conducted regarding the energy use or energy efficiency of MHLFs over time. (NEMA, No. 2 at p. 7) DOE agrees that referencing ANSI C82.6-2015 (R2020), which is a reaffirmation of ANSI C82.6-2015, helps to ensure repeatability and reproducibility of the test procedure, and therefore proposes incorporating this industry standard by reference. Further comment on this topic is welcome.

DOE also requested comment on whether the existing test procedure limits a manufacturer's ability to provide additional MHLF features to customers. 83 FR 24683. NEMA reiterated the lack of growth and development in this market and commented that, as a result,

customers are not seeking additional features for these products and therefore no updates are needed to the test procedure to address new features. (NEMA, No. 2 at p. 9) DOE appreciates NEMA's feedback that no updates are currently necessary to the existing test procedure to support the testing of new features. Further comment on this topic is welcome.

#### **IV. Procedural Issues and Regulatory Review**

##### **A. Review Under Executive Order 12866**

The Office of Management and Budget ("OMB") has determined that test procedure rulemakings do not constitute "significant regulatory actions" under section 3(f) of Executive Order 12866, "Regulatory Planning and Review." 58 FR 51735 (Oct. 4, 1993). Accordingly, this action was not subject to review under the Executive Order by the Office of Information and Regulatory Affairs ("OIRA") in the OMB.

##### **B. Review Under the Regulatory Flexibility Act**

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires preparation of an initial regulatory flexibility analysis ("IFRA") for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by Executive Order 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (Aug. 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's website: <https://energy.gov/gc/office-general-counsel>.

DOE reviewed this proposed rule under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. DOE tentatively concludes that

the proposed rule, if adopted, would not have significant economic impact on a substantial number of small entities. The factual basis of this certification is set forth in the following paragraphs.

The Small Business Administration (“SBA”) considers a business entity to be a small business, if, together, with its affiliates, it employs less than a threshold number of workers specified in 13 CFR part 121. These size standards and codes established by the North American Industry Classification System (“NAICS”) and are available at <https://www.sba.gov/document/support--table-size-standards>. Metal halide lamp ballast manufacturing is classified under NAICS 335311, “Power, Distribution, and Specialty Transformer Manufacturing.” The SBA sets a threshold of 750 employees or fewer for an entity to be considered as a small business for this category. MHLF manufacturing is classified under NAICS 335122, “Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing.” The SBA sets a threshold of 500 employees or less for an entity to be considered as a small business for this category.

To estimate the number of companies that could be small businesses that manufacture these ballasts, DOE conducted a market survey using publicly available information. DOE’s research involved reviewing information provided by trade associations (*e.g.*, the National Electrical Manufacturers’ Association), information from individual company websites, market research tools (*i.e.*, Hoover’s reports) and DOE’s certification and compliance database. DOE screened out companies that do not meet the definition of a “small business” or are completely foreign owned and operated. DOE identified five small businesses that produce metal halide lamp ballasts sold in the United States and can be considered small business manufacturers. For MHLFs, DOE identified approximately 54 small businesses that produce MHLFs sold in the United States and can be considered small business manufacturers.

Because DOE has tentatively concluded that the proposed amendments would not increase the industry cost of the existing test procedure (see section III.H.1), DOE tentatively concludes that the impacts of the test procedure amendments proposed in this NOPR would not have a “significant economic impact on a substantial number of small entities,” and that the preparation of an IRFA is not warranted. DOE will transmit the certification and supporting statement of factual basis to the Chief Counsel for Advocacy of the Small Business Administration for review under 5 U.S.C. 605(b). DOE requests comment on the impacts of the test procedure amendments proposed in this NOPR on small businesses.

#### C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of MHLFs must certify to DOE that their equipment complies with any applicable energy conservation standards. To certify compliance, manufacturers must first obtain test data for their equipment according to the DOE test procedures, including any amendments adopted for those test procedures. DOE has established regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including MHLFs. (See generally 10 CFR part 429.) The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (“PRA”). This requirement has been approved by OMB under OMB Control Number 1910-1400. Public reporting burden for the certification is estimated to average 35 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information



subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

#### D. Review Under the National Environmental Policy Act of 1969

DOE is analyzing this proposed regulation in accordance with the National Environmental Policy Act of 1969 (“NEPA”) and DOE’s NEPA implementing regulations (10 CFR part 1021). DOE’s regulations include a categorical exclusion for rulemakings interpreting or amending an existing rule or regulation that does not change the environmental effect of the rule or regulation being amended. 10 CFR part 1021, Subpart D, Appendix A5. DOE anticipates that this rulemaking qualifies for categorical exclusion A5 because it is an interpretive rulemaking that does not change the environmental effect of the rule and otherwise meets the requirements for application of a categorical exclusion. See 10 CFR 1021.410. DOE will complete its NEPA review before issuing the final rule.

#### E. Review Under Executive Order 13132

Executive Order 13132, “Federalism,” 64 FR 43255 (Aug. 4, 1999), imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in developing such regulations. 65 FR 13735. DOE has examined this proposed rule and has determined that it would not have a substantial direct effect on the States, on the relationship between the national government and

the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subject of this proposed rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

#### F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, “Civil Justice Reform,” 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, the proposed rule meets the relevant standards of Executive Order 12988.

#### G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (“UMRA”) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Pub. L. 104-4, sec. 201 (codified at 2 U.S.C. 1531). For a proposed regulatory action likely to result in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of \$100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed “significant intergovernmental mandate,” and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820; also available at <https://energy.gov/gc/office-general-counsel>. DOE examined this proposed rule according to UMRA and its statement of policy and determined that because the rule contains neither an intergovernmental mandate nor a mandate that may result in the expenditure of \$100 million or more in any year, these requirements do not apply.

#### H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999, (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This proposed rule would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

#### I. Review Under Executive Order 12630

DOE has determined, under Executive Order 12630, “Governmental Actions and Interference with Constitutionally Protected Property Rights,” 53 FR 8859 (Mar. 18, 1988), that this proposed regulation would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

#### J. Review Under Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001, (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. OMB’s guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE’s guidelines were published at 67 FR 62446 (Oct. 7, 2002). Pursuant to OMB Memorandum M-19-15, Improving Implementation of the Information Quality Act (April 24, 2019), DOE published updated guidelines which are available at <https://www.energy.gov/sites/prod/files/2019/12/f70/DOE%20Final%20Updated%20IQA%20Guidelines%20Dec%202019.pdf>. DOE has reviewed this proposed rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

#### K. Review Under Executive Order 13211

Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB, a Statement of Energy Effects for any proposed significant energy action. A “significant energy action” is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the

Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

This proposed regulatory action to amend the test procedure for measuring the energy consumption of MHLFs is not a significant regulatory action under Executive Order 12866. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects.

#### L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–91; 42 U.S.C. 7101), DOE must comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977. (15 U.S.C. 788; FEAA) Section 32 essentially provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission (“FTC”) concerning the impact of the commercial or industry standards on competition.

The proposed modifications to the test procedure for metal halide lamp ballasts in this NOPR incorporates testing methods contained in the following commercial standards:

- 1) ANSI C78.43, “American National Standard for Electric Lamps—Single-Ended Metal Halide Lamps,” 2017;
- 2) ANSI C78.44, “American National Standard for Electric Lamps—Double-Ended Metal Halide Lamps,” 2016;
- 3) ANSI C82.6, “American National Standard for Lamp Ballasts—Ballasts for High-Intensity Discharge Lamps—Methods of Measurement,” 2020;
- 4) ANSI C82.9, “American National Standard for Electric Lamps— High Intensity Discharge and Low-Pressure Sodium Lamps— Definitions,” 2016; and
- 5) IEC Standard 62301, “Household electrical appliances – Measurement of standby power (Edition 2.0, January 2011),” 2011.

DOE has evaluated these standards and is unable to conclude whether they fully comply with the requirements of section 32(b) of the FEAA (15 U.S.C. 775) (*i.e.*, whether they were developed in a manner that fully provides for public participation, comment, and review). DOE will consult with both the Attorney General and the Chairman of the FTC concerning the impact of these test procedures on competition, prior to prescribing a final rule.

#### M. Description of Materials Incorporated by Reference

In this NOPR, DOE proposes to incorporate by reference the test standard published by ANSI, titled “American National Standard for Electric Lamps—Single-Ended Metal Halide Lamps,” ANSI C78.43-2017. ANSI C78.43-2017 is an industry accepted test standard that specifies the physical and electrical requirements for single-ended metal halide lamps operated on 60 Hz ballasts. The test procedure proposed in this NOPR references ANSI C78.43-2017 for characteristics of reference lamps that must be used when testing metal halide lamp ballasts. ANSI C78.43-2017 is readily available on ANSI’s website at <https://webstore.ansi.org/>.

DOE also proposes to incorporate by reference the test standard published by ANSI, titled “American National Standard for Electric Lamps—Double-Ended Metal Halide Lamps,” ANSI C78.44-2016. ANSI C78.44-2016 is an industry accepted test standard that sets forth the physical and electrical requirements for double-ended metal halide lamps operated on 60 Hz ballasts. The test procedure proposed in this NOPR references ANSI C78.44-2016 for characteristics of reference lamps that must be used when testing metal halide lamp ballasts. ANSI C78.44-2016 is readily available on ANSI’s website at <https://webstore.ansi.org/>.

DOE also proposes to incorporate by reference the test standard published by ANSI, titled “American National Standard for Lamp Ballasts—Ballasts for High-Intensity Discharge Lamps—Methods of Measurement,” ANSI C82.6-2015 (R2020). ANSI C82.6-2015 (R2020) is an industry accepted test standard that describes the procedures and the precautions to be taken in measuring performance of low-frequency ballasts (electromagnetic and electronic ballasts that operate at less than 400 Hz) for HID lamps. The test procedure proposed in this NOPR references sections of ANSI C82.6-2015 (R2020) for general testing conditions and methods for the measurement of ballast operating characteristics. ANSI C82.6-2015 (R2020) is readily available on ANSI’s website at <https://webstore.ansi.org/>.

DOE also proposes to incorporate by reference the test standard published by ANSI, titled “American National Standard for Electric Lamps— High Intensity Discharge and Low-Pressure Sodium Lamps— Definitions,” ANSI C82.9-2016. ANSI C82.9-2016 is an industry accepted standard that provides definitions related to specific terms related to HID lamps and ballasts. The test procedure proposed in this NOPR references ANSI C82.9-2016 for defining reference lamps which are used when testing metal halide lamp ballasts. ANSI C82.9-2016 is readily available on ANSI’s website at <https://webstore.ansi.org/>.

In this NOPR, DOE proposes to incorporate by reference the test standard published by IEC, titled “Household electrical appliances – Measurement of standby power (Edition 2.0, January 2011),” IEC 62301:2011. IEC 62301:2011 is an industry accepted test standard that describes measurements of electrical power consumption in standby mode, off mode, and network mode. The test procedure proposed in this NOPR references sections of IEC Standard 62301:2011 for testing standby mode power consumption of metal halide lamp ballasts. IEC 62301:2011 is readily available on IEC’s website at <https://webstore.iec.ch/home>.

## **V. Public Participation**

### **A. Participation in the Webinar**

The time and date of the webinar are listed in the **DATES** section at the beginning of this document. If no participants register for the webinar, it will be cancelled. Webinar registration information, participant instructions, and information about the capabilities available to webinar participants will be published on DOE’s website:

[https://www1.eere.energy.gov/buildings/appliance\\_standards/standards.aspx?productid=14](https://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=14)

Participants are responsible for ensuring their systems are compatible with the webinar software.

### **B. Submission of Comments**

DOE will accept comments, data, and information regarding this proposed rule no later than the date provided in the **DATES** section at the beginning of this proposed rule. Interested parties may submit comments using any of the methods described in the **ADDRESSES** section at the beginning of this document.

*Submitting comments via <https://www.regulations.gov>.* The <https://www.regulations.gov> web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact



information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to <https://www.regulations.gov> information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (“CBI”). Comments submitted through <https://www.regulations.gov> cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through <https://www.regulations.gov> before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that <https://www.regulations.gov> provides after you have successfully uploaded your comment.

*Submitting comments via email.* Comments and documents submitted via email also will be posted to <https://www.regulations.gov>. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. No facsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

*Campaign form letters.* Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

*Confidential Business Information.* According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked non-confidential with the information believed to be confidential deleted.

DOE will make its own determination about the confidential status of the information and treat it according to its determination.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

### C. Issues on Which DOE Seeks Comment

Although DOE welcomes comments on any aspect of this proposal, DOE is particularly interested in receiving comments and views of interested parties concerning the following issues:

- 1) DOE requests comment on its proposal to incorporate by reference ANSI C82.6-2015 (R2020), ANSI C78.43-2017, ANSI C78.44-2016, ANSI C82.9-2016, and IEC 62301:2011.
- 2) DOE requests comment on the proposal to specify that dimming metal halide lamp ballasts be tested at maximum input power.
- 3) DOE requests comment on the proposed requirements for selecting reference lamps for ballasts capable of operating lamps of different wattages or lamp types, and specifically the proposals to test ballasts with lamps at the highest lamp wattage and to test with quartz metal halide lamps.
- 4) DOE requests comment on its proposal to directly reference the basic stabilization method section and alternative stabilization method section of ANSI C82.6-2015 (R2020). DOE also requests comment on its proposal to retain the lamp stability criteria for the basic stabilization method.
- 5) DOE requests comment on referencing the active mode test method section for the test conditions and setup of the standby mode test method and for the connection of lamps (with the exception of reference lamp requirements).

- 6) DOE requests comment on proposed instructions requiring the lamp be turned on to ensure the ballast is not defective prior to measuring standby mode energy consumption.
- 7) DOE requests comment on referencing section 5 of IEC 62301:2011 for stabilization and standby mode energy consumption measurements.
- 8) DOE requests comment on DOE's tentative determination that the proposed updates would not change measured values used for certifying compliance with existing energy conservation standards.
- 9) DOE seeks comment on whether the proposed test procedure, if adopted, is reasonably designed to produce results that measure the energy use or efficiency of MHLFs during a representative average use cycle or period of use.
- 10) DOE requests comments, data, and information regarding the cost impact and test burden of the proposed amendments in this NOPR to manufacturers.
- 11) DOE requests comment on the impacts of the proposed test procedure amendments on small businesses.
- 12) DOE requests comments on any other aspect of the existing test procedure for MHLFs not already addressed by the specific areas identified in this document.

## **VI. Approval of the Office of the Secretary**

The Secretary of Energy has approved publication of this proposed rule.

### **List of Subjects in 10 CFR Part 431**

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Incorporation by reference, Reporting and recordkeeping requirements, and Small business.

## Signing Authority

This document of the Department of Energy was signed on June 23, 2021, by Kelly Speakes-Backman, Principal Deputy Assistant Secretary and Acting Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on June 23, 2021.

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Treena V. Garrett  
Federal Register Liaison Officer,  
U.S. Department of Energy

For the reasons stated in the preamble, DOE is proposing to amend part 431 of chapter II of title 10, Code of Federal Regulations as set forth below:

**PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN  
COMMERCIAL AND INDUSTRIAL EQUIPMENT**

1. The authority citation for part 431 continues to read as follows:

**Authority:** 42 U.S.C. 6291–6317; 28 U.S.C. 2461 note.

2. Section 431.322 is amended by:

a. Removing the definitions for “AC control signal”, “DC control signal”, and “Wireless control signal”;

b. Revising the definition of “Ballast efficiency”; and

c. Adding in alphabetical order, definitions for “Ceramic metal halide lamp”, “Quartz metal halide lamp”, and “Reference lamp”.

The revision and addition read as follows:

**§431.322 Definitions concerning metal halide lamp ballasts and fixtures.**

\* \* \* \* \*

*Ballast efficiency* means, in the case of a high intensity discharge fixture, the efficiency of a lamp and ballast combination, expressed as a percentage, and calculated in accordance with the following formula:  $\text{Efficiency} = P_{\text{out}}/P_{\text{in}}$  where:

(1)  $P_{\text{out}}$  equals the measured operating lamp wattage; and

(2)  $P_{\text{in}}$  equals the measured operating input wattage.

\* \* \* \* \*

*Ceramic metal halide lamp* means a metal halide lamp with an arc tube made of ceramic materials.

\* \* \* \* \*

*Quartz metal halide lamp* means a metal halide lamp with an arc tube made of quartz materials.

*Reference lamp* is a metal halide lamp that meets the operating conditions of a reference lamp as defined by ANSI C82.9-2016 (incorporated by reference; see §431.323).

\* \* \* \* \*

3. Section 431.323 is amended by:

- a. Revising paragraphs (a) and (b)(1);
- b. Redesignating paragraph (b)(2) as paragraph (b)(3);
- c. Adding new paragraph (b)(2);
- d. Revising newly redesignated paragraph (b)(3);
- e. Adding paragraph (b)(4);
- f. Redesignating paragraph (c) as paragraph (d); and
- g. Adding new paragraph (c).

The revisions and additions read as follows:

**§431.323 Materials incorporated by reference.**

(a) Certain material is incorporated by reference into this subpart with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the DOE must publish a document in the FEDERAL REGISTER and the material must be available to the public. All approved material is available for inspection at the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Sixth Floor, 950 L'Enfant Plaza SW.,

Washington, DC 20024, (202) 586-2945, or go to <https://www.energy.gov/eere/buildings/appliance-and-equipment-standards-program>. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: [fedreg.legal@nara.gov](mailto:fedreg.legal@nara.gov), or go to: [www.archives.gov/federal-register/cfr/ibr-locations.html](http://www.archives.gov/federal-register/cfr/ibr-locations.html).

(b) \* \* \*

(1) ANSI C78.43 (“ANSI C78.43-2017”), American National Standard for Electric Lamps—Single-Ended Metal Halide Lamps, approved December 21, 2017, IBR approved for §431.324.

(2) ANSI C78.44 (“ANSI C78.44-2016”), American National Standard for Electric Lamps—Double-Ended Metal Halide Lamps, approved July 1, 2016, IBR approved for §431.324.

(3) ANSI C82.6 (“ANSI C82.6-2015 (R2020)”), American National Standard for Lamp Ballasts—Ballasts for High-Intensity Discharge Lamps—Methods of Measurement, approved March 30, 2020, IBR approved for §§431.322 and 431.324.

(4) ANSI C82.9 (“ANSI C82.9-2016”), American National Standard for Electric Lamps— High Intensity Discharge and Low-Pressure Sodium Lamps— Definitions, approved July 12, 2016, IBR approved for §§431.322 and 431.324.

(c) IEC. International Electrotechnical Commission, available from the American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, (212) 642-4900, or go to <https://webstore.ansi.org>.

(1) IEC 62301 (“IEC 62301”), Household electrical appliances—Measurement of standby power, (Edition 2.0, 2011-01), IBR approved for §431.324;

(2) [Reserved]

\* \* \* \* \*

4.

Section 431.324 is revised to read as follows:



**§431.324 Uniform test method for the measurement of energy efficiency and standby mode energy consumption of metal halide lamp ballasts.**

(a) *Scope.* This section provides test procedures for measuring, pursuant to EPCA, the energy efficiency of metal halide lamp ballasts. After [DATE 30 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER] and prior to [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER] any representations with respect to energy use or efficiency of metal halide lamp fixtures must be in accordance with the results of testing pursuant to this section or the test procedures as they appeared in §431.324 revised as of January 1, 2019. On or after [DATE 180 DAYS AFTER DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER], any representations, including certifications of compliance for metal halide lamp fixtures subject to any energy conservation standard, made with respect to the energy use or efficiency of metal halide lamp fixtures must be made in accordance with the results of testing pursuant to this section.

(b) *Active Mode Procedure.* (1) *General Instructions.* Specifications in referenced standards that are recommended, that “shall” or “should” be met, or that are not clearly mandatory, are mandatory. In cases where there is a conflict between any industry standard(s) and this section, the language of the test procedure in this section takes precedence over the industry standard(s).

(2) *Test Conditions and Setup.* (i) The power supply, ballast conditions, lamp position, and instrumentation must all conform to the requirements specified in section 4.0 of ANSI C82.6-2015 (R2020) (incorporated by reference; see §431.323).

(ii) Airflow in the room for the testing period must be  $\leq 0.5$  meters/second.

- (iii) Test circuits must be in accordance with the circuit connections specified in section 6.3 of ANSI C82.6-2015 (R2020).
- (iv) For ballasts designed to operate lamps rated less than 150 W that have 120 V as an available input voltage, testing must be performed at 120 V. For ballasts designed to operate lamps rated less than 150 W that do not have 120 V as an available voltage, testing must be performed at the highest available input voltage. For ballasts designed to operate lamps rated greater than or equal to 150 W that have 277 V as an available input voltage, testing must be conducted at 277 V. For ballasts designed to operate lamps rated greater than or equal to 150 W that do not have 277 V as an available input voltage, testing must be conducted at the highest available input voltage.
- (v) Operate dimming ballasts at maximum input power.
- (vi) Select the metal halide lamp for testing as follows:
  - (A) The metal halide lamp used for testing must meet the specifications of a reference lamp as defined by ANSI C82.9-2016 (incorporated by reference; see §431.323) and the rated values of the corresponding lamp data sheet as specified in ANSI C78.43-2017 (incorporated by reference; see §431.323) for single-ended lamps and ANSI C78.44-2016 (incorporated by reference; see §431.323) for double-ended lamps.
  - (B) Ballasts designated with ANSI codes corresponding to more than one lamp must be tested with the lamp having the highest nominal lamp wattage as specified in ANSI C78.43-2017 or ANSI C78.44-2016, as applicable.
  - (C) Ballasts designated with ANSI codes corresponding to both ceramic metal halide lamps (code beginning with “C”) and quartz metal halide lamps (code beginning with “M”) of the same nominal lamp wattage must be tested with the quartz metal halide lamp.

(3) *Test Method. (i) Stabilization Criteria. (A) General Instruction.* Lamp must be seasoned as prescribed in section 4.4.1 of ANSI C82.6-2015 (R2020) (incorporated by reference; see §431.323).

(B) *Basic Stabilization Method.* Lamps using the basic stabilization method must be stabilized in accordance with section 4.4.2 of ANSI C82.6-2015 (R2020). Stabilization is reached when the lamp's electrical characteristics vary by no more than 3-percent in three consecutive 10- to 15-minute intervals measured after the minimum burning time of 30 minutes.

(C) *Alternative Stabilization Method.* In cases where switching from the reference ballast to test ballast without extinguishing the lamp is impossible, such as for low-frequency electronic ballasts, the alternative stabilization method must be used. Lamps using the alternative stabilization method must be stabilized in accordance with section 4.4.3 of ANSI C82.6-2015 (R2020).

(ii) *Test Measurements. (A)* The ballast input power during operating conditions must be measured in accordance with the methods specified in sections 6.1 and 6.8 of ANSI C82.6-2015 (R2020).

(B) The ballast output (lamp) power during operating conditions must be measured in accordance with the methods specified in sections 6.2 and 6.10 of ANSI C82.6-2015 (R2020).

(C) For ballasts with a frequency of 60 Hz, the ballast input and output power shall be measured after lamps have been stabilized according to section 4.4 of ANSI C82.6-2015 (R2020) using a wattmeter with accuracy specified in section 4.5 of ANSI C82.6-2015 (R2020); and

(D) For ballasts with a frequency greater than 60 Hz, the ballast input and output power shall have a basic accuracy of  $\pm 0.5$  percent at the higher of either 3 times the output operating frequency of the ballast or 2.4 kHz.

(iii) *Calculations.* (A) The measured ballast output (lamp) power, as measured in paragraph (b)(3)(ii)(B) of this section, must be divided by the measured ballast input power, as measured in paragraph (b)(3)(ii)(A) of this section, to determine the percent efficiency of the ballast under test to three significant figures.

(B) [Reserved]

(c) *Standby Mode Procedure.* (1) *General Instructions.* Measure standby mode energy consumption only for a ballast that is capable of operating in standby mode. Specifications in referenced standards that are recommended, that “shall” or “should” be met, or that are not clearly mandatory, are mandatory. When there is a conflict, the language of the test procedure in this section takes precedence over IEC 62301 (incorporated by reference; see §431.323).

(2) *Test Conditions and Setup.*

(i) Establish and maintain test conditions and setup in accordance with paragraph (b)(1) of this section.

(ii) Connect each ballast to a lamp as specified in paragraph (b)(2)(vii) of this section. Note: ballast operation with a reference lamp is not required.

(3) *Test Method and Measurement.*

(i) Turn on all of the lamps at full light output. If any lamp is not functional, replace the lamp and repeat the test procedure. If the ballast will not operate any lamps, replace the unit under test.

(ii) Send a signal to the ballast instructing it to have zero light output using the appropriate ballast communication protocol or system for the ballast being tested.

(iii) Stabilize the ballast prior to measurement using one of the methods as specified in section 5 of IEC 62301 (incorporated by reference; see §431.323).

(iv) Measure the standby mode energy consumption in watts using one of the methods as specified in section 5 of IEC 62301 (incorporated by reference; see §431.323).

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